The Influence of Incubation Media on the Gas Production of *In vitro* Rumen Fluid Cultures

C.L.O. Leo-Penu[1,2], L.A. Fitzpatrick[1], A.J. Parker[1]

[1]School of Veterinary and Biomedical Sciences, James Cook University, Qld, Australia. [2]Kupang State Agricultural Polytechnic, Indonesia

The incubation media is a factor that may influence the gas production (GP) concentrations of *in vitro* ruminal fermentation and degradability of feedstuffs (Mould et al., 2005). Cumulative *In vitro* GP is associated with feedstuff degradation (Mould et al. 2005). However, GP alone does not provide direct information on either the extent of degradation or the quantity of fermentative end products. Some authors have questioned the use of complex buffer solutions such as the Goering Van Soest media, suggesting a simplified *in vitro* media would improve safety and reduce cost without negatively impacting on analytical precision (Mould et al., 2005). The current experiment was conducted to compare the Goering-Van Soest and Kansas State incubation media as commonly used in ruminal *in vitro* studies to evaluate feedstuffs (Goering and Van Soest, 1970; Marten and Barnes, 1979). The *in vitro* gas production (GP) was completed using a commercial wireless GP apparatus (Ankom^{RF} GP System). The study included eight replicates and two controls for each of the two treatments. Each module (250ml) was filled with 1g of ground Rhodes grass (*Chloris gayana*) hay, and either 105ml of the Goering Van Soest or Kansas State buffer solutions preheated to 39^{0}C. Rumen fluid was collected 3h after the morning feeding from fistulated Brahman steers consuming Rhodes grass hay. The rumen inoculums (25ml) were poured into each of the vessels. Anaerobic conditions were maintained throughout the preparation and conduct of the experiment. The apparatus was set up to record GP every 15 minute to avoid super-saturation of the liquid phase. Results are described in Figure 1.

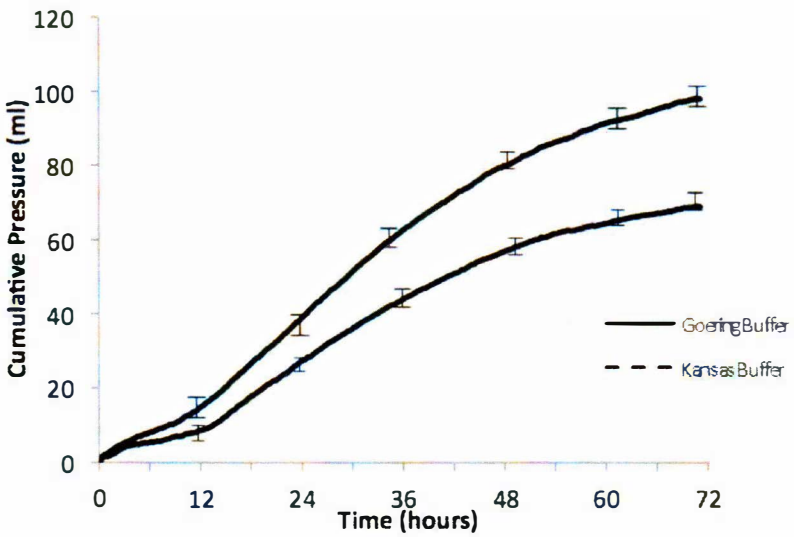

Figure 1. Cumulative gas production from the *In vitro* fermentation of Rhodes grass (*Chloris gayana*) hay using the Kansas State Buffer or the Goering Van Soest buffer as incubation media

The Goering-Van Soest buffer allowed greater GP than the Kansas State buffer in this experiment at 24, 48 and 72h ($P<0.001$). The Goering-Van Soest media demonstrated a greater buffering capacity for in vitro fermentation and degradability studies of Rhodes grass hay as demonstrated by GP. The pH declined ($p<0.05$) for both treatments throughout the experiment. The Goering Van Soest treatment declined from 7.4 to 6.81 whereas the Kansas State buffer decreased from 6.80 to 6.39. The decline in pH may have affected the cellulolytic bacterial population in the Kansas State Buffer treatment. When undertaking or comparing *in vitro* studies using cellulolytic substrates consideration needs to be given to the incubation media used.

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Corresponding Email: anthony.parker@jcu.edu.au